Gas-Filled Panels: New and Superior Thermal-Insulation

Gas-Filled Panels (GFP) are a superior, lightweight, energy-efficient, space-saving insulation that could revolutionize appliances, automobiles, airplanes, and building structures.

GFPs provide increased energy efficiency in less space. For example, a 1″ thick, R-12 (krypton) GFP provides performance equivalent to a 2″ thick piece of foam. The panels are easy to manufacture. They may either be transported in a collapsed state and inflated on location, or prefilled for shipment.

Conceived in the 1990s as an alternative to CFC and HCFC blown-foam insulation, GFPs are a lightweight, safe insulating material made from thin, infrared, reflecting, multilayer, aluminized plastic baffles. The baffles are enveloped by a sealed barrier and filled with a low conductivity inert gas (argon, krypton, or xenon) or air (at atmospheric pressure).

A Gas-Filled Panel with plastic baffles

GFPs, unlike conventional insulation materials, lie flat until inflated and take up far less space when disposed—ideal for future use in modular, all plastic, recyclable appliances. They are flexible enough to produce insulation of different shapes and sizes. Unlike polystyrene foam, they do not crack.

Gas-Filled Panels: A Wide Range of Applications

This lightweight, space-saving insulation will improve efficiency in appliances, automobiles and airplanes, and building structures. GFP technology holds great promise for insulation in appliances, such as refrigerators, where space for insulation is limited. In automobile, truck, and RV applications, use of GFPs combines thermal insulation and sound dampening in a single device. This can improve passenger comfort, reduce manufacturing costs, and offer up to 75% weight savings for comparable parts.

Potential applications of GFP: in refrigerators (above) and automobiles (right)

Gas-Filled Panels: Currently in Use for Shipping of Perishable Goods

With a license for Gas-Filled Panel technology from Berkeley Lab, Cargo Tech's AirLiner product is expected to modernize the transportation of meats, fruit, prepared foods, pharmaceutical products, and other perishable cargos.

An AirLiner container by Cargo Tech Inc.

Gas-Filled Panels: Development Status

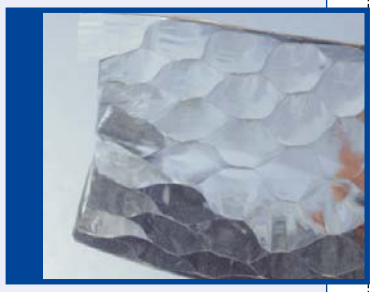
- U.S. patent number 5,270,092
- GFP products are currently under development for residential, commercial, and industrial building insulation.

Gas-Filled Panel technology is available for licensing in transportation, appliances and other insulation needs.

See contacts on the back.

Performance & Effectiveness

- **Thermal Performance:** Independent thermal testing using ASTM C-518 has shown GFPs outperform conventional insulation materials such as glass fiber batt, polystyrene foam, fluorocarbon expanded polyurethane foam, and cellulose fibre.



R-5/in. (air); R-7/in. (argon); R-12/in. (krypton); R-20/in. (xenon)

Effective conductivity 0.029–0.007 W/m/K

- **Cost:** Lower cost of material (in $/ft^2-R, where R values are in hr-ft^2-°F/Btu): 0.01–0.02 (air); 0.02–0.03 (argon)

- **Weight:** Half the weight of foam: 0.6–1.5 lbs/ft^3 (10–24 kg/m^3)

- **Material:** GFPs use less than 5% of the solids used in foam insulation

Berkeley Lab

Contacts

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Gas-Filled Panels

GFP

R&D 100 Award Winner

Better Insulation *for a* Better Environment

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